Integrating & Presenting Clinical and Treatment Outcome Data for Cost-Effective Case Management

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The Dept. of Orthopaedics and Rehabilitation at Vanderbilt University Medical Center is currently developing an information system which integrates various sources of clinical data to facilitate treatment outcome assessment in the lumbar spine service. Information captured and stored in this system will allow for more timely and accurate prognostic predictions and create a formal mechanism for detecting practice variability.

During a patient encounter, physicians often do not have the capability to review outcomes of similar patients in an easy, flexible, and time-efficient manner. This limits the physician's ability to effectively gauge anticipated cost and benefit of a treatment with perceived treatment outcome. Previously reported systems[1,2] provide similar information but are not "integrative" in nature. That is, they are designed to use a single, specialty database for storing clinical data in an orthopaedic practice. Users of such systems often use keywords and/or ICD9/CPT codes to perform searches for clinical research. This approach is not very practical for performing ad-hoc analysis of patient profiles directly in the clinic.

By contrast, our system attempts to address this dilemma by focusing not only on coded search retrieval but also on the integrated presentation of collected data from various databases to support clinical decision making. Our system provides a tool to assist in exploring patient outcomes on-line so that accurate information can be efficiently delivered in a clinic stetting. This directly addresses the goal of "cost-effective" clinical computing.

Various sources of data are integrated to support analysis of functional capacity and self-report outcomes with respect to clinical symptoms presented during a patient encounter. Inputs consist of: 1) clinical description of the low back pain patient 2) SF-36 General Health Status Questionnaire, and 3) ICD-9 and CPT codes for each patient and each encounter. A pen computer interface (presented at AMIA Spring Congress 1994) captures lumbar spine data gathered during the physical exam, biomechanical testing, radiograph review, and in post-surgery notes. The SF-36 General Health Status Questionnaire is a well-established tool used to objectively determine a patient's self-reported well-being. Inpatient and selected outpatient surgical data comes from the HIS mainframe computer.

Outputs of the system at each patient encounter include: 1) SF-36 Summary Reports 2) longitudinal summaries of clinical parameters, and 3) descriptive statistics that characterize changes in a patient's health status and support comparisons with other subgroups of patients. Ultimately, the system will present cost information (average) based on a given patient's clinical profile. The system allows for statistical exploration across disjoint data sets upon creating user-defined sub-groupings of variables of interest. Using a graphic user interface, a physician is able to print reports and generate plots of selected data while in the clinic or office. This system serves as a tool to provide direct quantitative feedback and assists in making difficult clinical decisions which contribute to practice variability. During a patient encounter, the physician formulates a hypothesis regarding appropriate forms of treatment and he/she may then use this system to explore previous treatment outcomes for similar cases. For example, the physician can study clinical profiles from patients who have had lumbar spinal fusions with a specific brand of instrumentation (e.g. Harrington Rods) for patients who smoke regularly, climb several flights of stairs daily, and have had moderate bodily pain which has interfered with their occupation. The availability of such a tool in the clinic to present information in an outcome-oriented format is crucial to the delivery of cost-efficient, high-quality health care.

References

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